Electronic Version
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Claims

[c1] 1.An imaging system comprising:
an MR imaging apparatus to acquire MR data of a subject; and
an x-ray imaging apparatus having a rotatable anode integrally disposed in the MR imaging apparatus to acquire radiographic data of the subject.

[c2] 2.The imaging system of claim 1 further comprising a motor assembly configured to rotate the anode in a magnetic field generated in a magnet bore of the MR imaging apparatus during data acquisition.

[c3] 3.The imaging system of claim 2 wherein the motor assembly includes a non-magnetic flux motor.

[c4] 4.The imaging system of claim 3 wherein the non-magnetic flux motor includes a piezoceramic motor.

[c5] 5.The imaging system of claim 2 wherein the motor assembly includes a radial flux motor designed to rotate the anode at a specified frequency before MR data acquisition.

[c6] 6.The imaging system of claim 5 wherein the anode is

configured to rotate in the magnet bore from the specified frequency to a slower frequency without a force applied thereon by the radial flux motor during MR data acquisition.

[c7] 7.The imaging system of claim 2 wherein the motor assembly includes a radial flux motor and a biasing spring operationally connected to the anode such that rotation of the anode by the radial flux motor biases the spring in a stored energy condition.

[c8] 8.The imaging system of claim 8 wherein the spring is further configured to rotate the anode when the bias placed on the spring is removed.

[c9] 9.The imaging system of claim 1 wherein the MR imaging apparatus includes a split-coil MR magnet.

[c10] 10.An MR apparatus comprising:
a magnetic resonance imaging (MRI) system having a plurality of gradient coils positioned about a bore of a magnet to impress a polarizing magnetic field and an RF transceiver system and an RF switch controlled by a pulse module to transmit RF signals to an RF coil assembly to acquire MR images; and
a motor assembly configured to control rotation of a rotatable anode disposed in the bore of the magnet.

[c11] 11.The MR apparatus of claim 10 wherein the motor assembly includes a piezoceramic drive motor.

[c12] 12.The MR apparatus of claim 10 wherein the motor assembly includes a radial flux motor configured to rotate the anode prior to data acquisition and not rotate the anode during data acquisition.

[c13] 13.The MR apparatus of claim 10 wherein the motor assembly further includes an energy storage device operationally connected to the anode.

[c14] 14.The MR apparatus of claim 13 wherein the motor assembly is further configured to counter-rotate the anode so as to store energy in the energy storage device.

[c15] 15.The MR apparatus of claim 14 wherein the energy storage device includes a spring.

[c16] 16.A method of diagnostic imaging comprising the steps of:

impressing a substantially homogeneous magnetic field about a subject;

projecting high frequency electromagnetic energy at the subject;

rotating an anode of a high frequency electromagnetic energy tube assembly in the magnetic field during the

projecting; and

acquiring MR and radiographic data from the subject.

[c17] 17.The method of claim 16 wherein the step of rotating includes the step of allowing the anode to decelerate in rotational speed from a pre-data acquisition rotational speed during data acquisition.

[c18] 18.The method of claim 17 wherein the pre-data acquisition rotational speed includes approximately 200 Hz.

[c19] 19.The method of claim 16 wherein the step of rotating includes the step of counter-rotating the anode prior to data acquisition to store energy in a spring connected to the anode and thereafter removing a bias placed on the anode to allow the spring to release the stored energy during data acquisition.

[c20] 20.The method of claim 19 including the step of counter-rotating the anode with a radial flux motor.

[c21] 21.The method of claim 16 including the step of rotating the anode during data acquisition with a piezoceramic motor.